Approaches to the Evaluation and Assessment of Progress and Performance of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative

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TABLE OF CONTENTS

		Page
Abbreviations		iv
Preface		v
Executive Summary		vi
1.	INTRODUCTION	1
2.	WHAT IS PROGRAM EVALUATION?	2
2.1	Why Evaluate?	2
2.2	What Makes a Good Evaluation System?	3
2.3	What Should be Evaluated and How Should it be Done?	4
2.4	What Makes a Successful Integrated Ocean Management Program?	7
2.5	What Approaches are Used to Assess Progress in Integrated Coastal and Ocean Management?	11
2.6.	What are Some of the Key ICOM Evaluations that Have Been Done in Canada?	12
2.7.	How are Indicators Developed and Used in Evaluation	15
3.	WHAT ARE THE DIMENSIONS OF ESSIM THAT NEED EVALUATION?	19
3.1	Some of Canada's International Commitments	19
3.2	The Federal Governments Commitments to Integrated Oceans Management	20
3.3	Provincial and Local Issues	22
4.	APPROACHES TO EVALUATING THE ESSIM PLAN	23
4.1	Using Canada's Policy and Operational Framework for Integrated Management of Marine Environments	23
4.2	Contextual Evaluation of ESSIM	27
4.3	Input Evaluation of the ESSIM Plan	29
4.4	Process Evaluation of ESSIM	31
4.5	Product and Outcome Evaluation	31
5.	RECOMMENDATIONS FOR IMPLEMENTATION	34
6.	REFERENCES	36
ANNEXES		
1. List of Recommended Attributes to Monitor Progress and Performance in Implementing ICOM		40
2. ESSIM Objectives and Examples of Evaluation Questions and Indicators		42

ABBREVIATIONS

CCESD	Canadian Commissioner for Environment and Sustainable Development
DFO	Department of Fisheries and Oceans
DPSIR	Driving Force, Pressure, State, Impact, Response
ESSIM	Eastern Scotian Shelf Integrated Management Initiative
FAO	Food and Agricultural Organization of the United Nations
ICOM	Integrated Coastal and Ocean Management
IOC	Intergovernmental Oceanographic Commission
IUCN	International Union for the Conservation of Nature – The World Conservation Union
JPI	Johannesburg Plan of Implementation
LFA	Logical Framework Analysis
MoU	Memorandum of Understanding
RAP	Regional Advisory Process
RCOM	Regional Committee on Ocean Management
SAC	Stakeholder Advisory Council
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
USEPA	United States Environmental Protection Agency

PREFACE

The objective of this report is to provide ESSIM stakeholders with general concepts of program evaluation and how these could be applied to guide the initiative in the future. This report is not the actual ESSIM evaluation framework, but rather an outline of the next steps and approaches required in developing such a framework. Although some comments are made about the current status of ESSIM, these should not be viewed as an evaluation of the initiative, but rather to stimulate discussion on the use of evaluation as a process for directing and driving the initiative towards its planned outcomes. There is no "off-the-shelf" evaluation program that can be readily used for ESSIM – an ESSIM evaluation program is, therefore, one that needs to be custom-developed by its stakeholders based on what is deemed most appropriate and practical. It is hoped that this document is useful in providing ideas to assist in this important task.

Comments on this report may be submitted to:

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EXECUTIVE SUMMARY

The draft ESSIM Plan contains 28 proposed objectives (outcomes), all of which are intended to improve specific aspects of governance, social, economic and ecological conditions in the ESSIM planning area. One of the key issues associated with programs involving integrated management of resources is the development of stakeholder capacity to understand, direct and implement the multiple objectives associated with the program. The development of an evaluation and monitoring system is considered to be the main foundation by which this can be achieved. There are, however, many challenges to be overcome in the development of an appropriate and workable evaluation system. The objective of this document is to provide ESSIM stakeholders with information and background on some of the perspectives and approaches that can be associated with evaluation and monitoring of the ESSIM Plan. The intention is that the document should serve as a starting point from which a workable operational framework for evaluation and monitoring can be developed through stakeholder participation and consensus.

The document presents some basic general concepts of program evaluation, including: rationale for evaluation, specifications for a credible evaluation system, different types of evaluation; success factors in integrated coastal and ocean management (ICOM), recommended approaches to assessing progress in ICOM; ICOM evaluation practice in Canada, indicator frameworks that might be useful, contextual aspects relevant to the evaluation of ESSIM, and how evaluation might be applied to the ESSIM project cycle.

Some proposed recommendations on how this might be advanced include the following:

1. Evaluation should become more prominent by becoming a core responsibility and function of the lead coordinating ESSIM governance structures (RCOM and SAC). All meetings of the coordinating structures should therefore have formal agenda items that are concerned with the process of evaluating various aspects of ESSIM. This includes contextual, input, process, product and outcome evaluations and also decisions on how to respond to the findings of evaluations.

2. A firm timetable for the rollout of the detailed strategies and action plans associated with each of the 28 ESSIM Plan objectives should be developed and agreed upon by stakeholders. This will then form the basis of all future plan evaluation.

3. There is a need for a process of debate and discussion on what ESSIM stakeholders would like to see being evaluated and how this should be done. The objective would be for stakeholders to agree on the specifications for a workable evaluation system that covers all of the necessary aspects of the ESSIM Plan and its implementation. This document could be used to provide background and starter material for this process.

4. The ESSIM Planning Office should play the role of facilitating all formal evaluations and for communicating findings to relevant parties.

5. In order to avoid the problem of evaluation becoming a burdensome and complex process, use could be made of the wider ESSIM stakeholder network for assistance. This could be achieved by having evaluation done by individuals, working groups, and panels from the network, selected on the basis of skills, experience and perspective. This would also raise the level of understanding, "buy in" and participation in the improvement of integrated ocean management for the Eastern Scotian Shelf.

6. The biennial ESSIM Forum stakeholder workshop has potential to become the main focal point for initiating, processing and finalizing all evaluation of ESSIM. The Forum meeting could focus on providing an overall assessment of the products, outcomes and progress and, where expectations have not been met, how these can be reached or improved. It could also examine forthcoming plans and provide an assessment of feasibility in terms of strategy and resources to be deployed.

7. A biennial "state of ESSIM report" should be prepared that contains a description of progress and achievements (against objectives), as well as outlining forthcoming activities for the next period. This report could form the major piece of documentation that is presented and discussed at the biennial ESSIM Forum Workshop.

8. Indicators for assessing progress and performance of ESSIM will be best identified through the preparation of the biennial state of ESSIM report. Their use and value will be confirmed through the ESSIM Forum evaluation process. The evaluation process will also identify new indicators that stakeholders wish to see included for future monitoring. It should be recognized that the set of indicators will change with time as ESSIM develops.

9. There will be a need, under certain circumstances, for specific and focused evaluations to be done by external specialists who are not part of the ESSIM network. Such evaluations should be identified and approved by RCOM and SAC as they will require careful consideration and planning, and more importantly, allocation of resources for their implementation.

10. The next stage of the ESSIM initiative, notably implementation of the plan (2007–2008), will require some form of prioritization of actions. An initial focus could be on the development of collaborative governance structures and processes that cover some priority issues, as these are the mechanisms by which capacity to achieve integrated management (and the achievement of anticipated social, economic and ecological outcomes) will be developed.

RÉSUMÉ

L'ébauche du plan de GIEPNE présente 28 objectifs (résultats visés), tous liés à l'amélioration d'aspects précis de la gouvernance et des conditions sociales, économiques et écologiques de la zone visée par la GIEPNE. Une des principales difficultés inhérentes aux programmes de gestion intégrée des ressources concerne le développement de la capacité des différents acteurs à comprendre et à diriger les programmes et à mettre en oeuvre les mesures nécessaires pour atteindre les multiples objectifs qui ont été fixés. La mise au point d'un système d'évaluation et de surveillance est considérée comme essentielle à cet égard. Il y a toutefois de nombreux obstacles à surmonter pour arriver à mettre au point un système d'évaluation adapté et viable. L'objectif de l'ébauche du plan est de présenter aux acteurs de la GIEPNE le contexte et les renseignements nécessaires sur les perspectives et les méthodes possibles d'évaluation et de surveillance du Plan de GIEPNE. Ce document est censé servir de point de départ pour l'élaboration, avec la participation et l'accord de la plupart des acteurs, d'un cadre opérationnel d'évaluation et de surveillance viable.

Le document couvre les grands aspects de l'évaluation de programmes, en présentant notamment le bien-fondé de l'évaluation, les caractéristiques d'un système d'évaluation fiable, les différents types d'évaluation, les facteurs de réussite de la gestion intégrée des zones côtières et des océans, les méthodes recommandées pour évaluer les progrès de la gestion intégrée des zones côtières et des océans, les pratiques d'évaluation utilisées au Canada dans ce domaine, les cadres d'indicateurs qui pourraient être utiles, les aspects contextuels pertinents pour l'évaluation de la GIEPNE et les façons dont l'évaluation pourrait s'appliquer au cycle du projet de GIEPNE.

Voici quelques-unes des recommandations qui ont été proposées :

11. L'évaluation devrait avoir une place plus importante et faire partie des responsabilités et fonctions essentielles des principales structures de gouvernance de la GIEPNE que sont le CRGO et le CCHD. Des points portant sur le processus d'évaluation des divers aspects de la GIEPNE devraient figurer à l'ordre du jour de toutes les réunions des structures de coordination, notamment en ce qui a trait à l'évaluation du contexte, des éléments d'entrée, des processus, des produits et résultats, puis aux décisions sur les moyens de réagir aux conclusions des évaluations.

12. Les acteurs de la GIEPNE devraient établir et approuver un échéancier ferme pour la mise en oeuvre des stratégies et des plans d'action précis concernant chacun des 28 objectifs du Plan, échéancier qui servirait de base pour toute évaluation ultérieure.

13. Il faudrait mettre sur pied un processus de débat et de discussion sur les aspects que les acteurs souhaiteraient voir évaluer et sur les méthodes à utiliser, l'objectif étant que tous s'entendent sur les caractéristiques d'un système d'évaluation viable qui couvrirait tous les aspects du plan de GIEPNE et de sa mise en oeuvre qui doivent être évalués. L'ébauche du plan pourrait être un moyen de présenter le contexte et servir de point de départ pour l'établissement de ce processus.

14. Le bureau de planification de la GIEPNE devrait jouer le rôle de catalyseur pour toutes les évaluations officielles et pour la présentation des résultats de ces évaluations aux parties concernées.

15. Pour éviter que l'évaluation ne devienne un processus lourd et compliqué, on pourrait solliciter l'aide du réseau élargi des acteurs de la GIEPNE en faisant faire l'évaluation par des individus, par des groupes de travail ou par des groupes d'experts du réseau, choisis en fonction de leurs

capacités, de leur expérience et de leurs perspectives. Ceci élèverait par ailleurs le niveau de compréhension, d'adhésion et de participation à l'amélioration de la gestion intégrée des océans pour l'est du plateau néo-écossais.

16. Le forum des acteurs de la GIEPNE qui a lieu tous les deux ans pourrait devenir le point central pour le lancement, le déroulement et la conclusion de toutes les activités d'évaluation de la GIEPNE. La réunion pourrait porter principalement sur l'évaluation globale des produits, des résultats et des progrès et, lorsque ceux-ci ne sont pas conformes aux attentes, sur les moyens d'atteindre les objectifs ou de s'en approcher. Elle pourrait aussi permettre d'examiner les plans à venir et d'évaluer la faisabilité en ce qui concerne la stratégie et les ressources à mobiliser.

17. Il faudrait rédiger un rapport bisannuel sur « l'état de la GIEPNE » qui comprendrait une description des progrès et des réalisations (par rapport aux objectifs) et qui tracerait les grandes lignes des activités prévues au cours des deux années à venir. Ce rapport pourrait être le principal document à étudier lors du forum bisannuel des acteurs de la GIEPNE.

18. L'établissement des indicateurs pour l'évaluation des progrès et de l'efficacité de la GIEPNE se fera idéalement lors de la rédaction du rapport bisannuel sur l'état de la GIEPNE. Leur utilisation et leur valeur seront confirmées par le processus d'évaluation du forum de la GIEPNE qui fixera, le cas échéant, les nouveaux indicateurs que les acteurs souhaiteront ajouter au processus de surveillance. Il faut garder à l'esprit que la série d'indicateurs évoluera en même temps que la GIEPNE.

19. Il faudra, dans certains cas, faire effectuer des évaluations spéciales et ciblées par des spécialistes externes au réseau de la GIEPNE. Ces évaluations devront être décidées et approuvées par le CRGO et le CCHD car elles devront être étudiées et planifiées avec précision et, surtout, elles nécessiteront la mobilisation de ressources.

20. La prochaine étape de l'initiative de GIEPNE, principalement la mise en application proprement dite du plan (2007-2008), nécessitera un classement par ordre de priorité des mesures à mettre en oeuvre. On pourrait tout d'abord mettre l'accent sur l'établissement de structures de gouvernance coopératives et de processus de traitement des problèmes prioritaires puisqu'il s'agit des mécanismes qui permettront de développer la capacité d'atteindre la gestion intégrée (et les résultats attendus sur le plan social, économique et écologique).

21.

1. INTRODUCTION

The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative, which commenced in December 1998, is a collaborative management and planning process facilitated by the Oceans and Coastal Management Division, Fisheries and Oceans Canada (DFO), Maritimes Region. It is concerned with the design and implementation of a multi-stakeholder integrated management and planning process for the Eastern Scotian shelf area, and is part of a Canada-wide program aimed at implementing the *Oceans Act* (DFO 2002; DFO 2005).

The purpose of ESSIM is to develop and implement a multi-year plan that provides long-term direction and commitment for integrated, ecosystem-based and adaptive management of all marine activities in or affecting the designated planning area (ESSIM Planning Office 2005).

ESSIM is an initiative that is still in a relatively early phase, having reached the stage where there is a draft plan that is currently undergoing stakeholder review and modification (ESSIM Planning Office 2005). Although there has been frequent reporting on the status and progress of ESSIM, this has not been done formally within the context of any performance or status assessment by stakeholders against set project or outcome objectives with associated time scales. There is still a need for the plan to develop and finalize objectives that include an ESSIM performance and progress assessment system. This need has recently been emphasized by the Canadian Commissioner for Environment and Sustainable Development (CCESD) in an evaluation report on implementation of the *Oceans Act* by DFO (CCESD 2005).

Program evaluation is most often defined as a process used to determine whether the design and delivery of a program is effective and whether the proposed outcomes have been met (Sork 2000). In the case of ESSIM, this relates to the merit and value of a long-term ocean coordination management plan with multiple facets. Evaluation of multi-stakeholder programs can, even under the best of circumstances, be extremely complicated because of the numerous aspects that need to be covered (Kellogg Foundation 1998). Therefore, it is essential that all stakeholders are exposed to, and participate in, the process of evaluation so as to create a system that is workable and useful.

The draft ESSIM Plan contains 28 proposed objectives (outcomes), all of which are intended to improve specific aspects of governance, social, economic and ecological conditions in the ESSIM planning area. One of the key issues associated with programs involving integrated management of resources is the development of stakeholder capacity to understand, direct and implement the multiple objectives associated with the program. The objective of this document is to provide ESSIM stakeholders with information and background on some of the perspectives and approaches that can be associated with evaluation and monitoring of the ESSIM Plan. The intention is that it should serve as a starting point from which an operational framework for evaluation and monitoring can be developed through stakeholder participation and consensus.

2. WHAT IS PROGRAM EVALUATION?

The evaluation of programs requires a practical approach (United States Environmental Protection Agency, USEPA, 2006) that relates to:

- Assessing the effectiveness of an ongoing program in achieving its objectives;
- Being able to distinguish a program's effects from those of other activities; and
- Program improvement through modification of current operations.

A review of the literature reveals that there is an exhaustive amount of global material on the evaluation of progress and performance of a wide variety of projects, programs and organizations in almost every social and economic sector. Associated with this is a plethora of terms and definitions that are used by practitioners and organizations that carry out program evaluations (e.g., Stufflebeam 2003; Kellogg Foundation 2006; Intergovernmental Oceanographic Commission, IOC, 2005a; USEPA 2006; and Aucoin 2005). Therefore, in developing an evaluation framework for ESSIM, it is important that stakeholders have an understanding of some of the key concepts and terminology that are used in evaluation.

This section endeavours to cover some of these main concepts and terminologies and relate them to ESSIM and integrated ocean management.

2.1 Why Evaluate?

There are many reasons why there should be routine and formal evaluations of programs and their activities. Some of the main ones include the following (Kellogg Foundation 1998; World Bank 2004; IOC 2005a; 2005b):

- To promote accountability for those (person or institutions) responsible for ensuring that actions take place;
- To reassure stakeholders and investors that there is an acceptable return on investment in terms of the resources allocated versus the outcomes, products and services that are delivered;
- To enhance sustainability of the program and its activities;
- To assess progress and performance against set objectives;
- To facilitate strategic planning and priority setting;
- To ensure quality in terms of process, outcomes and products;
- To improve effectiveness and efficiency;
- To assist in the identification of the indicators that are most useful to decision-makers, and which should be monitored;
- To assist in making appropriate management decisions; and
- To assist in the allocation and mobilization of necessary resources (i.e., funding, personnel, and equipment).

On the basis of this, it follows that the presence of a unified and functional evaluation system can be a useful management tool as it provides stakeholders with a common process and language for problem solving, negotiation, decision making, and reporting to the public and higher levels of authority (Kellogg Foundation 1998). It is thus important that every organization and program should develop and implement some form of evaluation system that supports its operations and activities.

The reasons for having an evaluation system for ESSIM have been well-articulated in the Canadian *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* (DFO 2002), which states that:

> An essential component of the Integrated Management planning process is the establishment of a practical performance evaluation framework to assess results. This framework will measure actions against objectives and targets, and needs to link required management actions to those with implementation, monitoring and/or enforcement powers. Results need to be clearly communicated to all partners to maintain on-going involvement and understanding of progress. This feedback should include regular performance reports on the ecosystem, institutional and socio-economic objectives, indicators, and associated management actions for the plan. The performance reports and results from Marine Environmental Quality monitoring activities will also provide the necessary information for periodic reporting on the State of the Ocean within the planning area and for Canada's other ocean spaces.
>
> The monitoring, evaluation and revision component of the plan is essentially the engine that keeps the cyclical Integrated Management process moving forward. Regular review of the plan is required to determine both how well it is working, and whether any significant new factors should be incorporated. The plan may need adaptations as a result of improved ecosystem understanding, increasing or cumulative pressures from ocean use activities, or the incorporation of new industries such as aquaculture or oil and gas development. Through adaptive management, various components of the Integrated Management plan may need to be revised based on findings and recommendations from on-going monitoring and review activities.

2.2 What Makes a Good Evaluation System?

There are many attributes that make up the specifications for an effective and credible organizational evaluation system. Such attributes have been identified from evaluation systems that have been used mainly in education (Stufflebeam 2003) and foreign aid development programs (World Bank 2004). Among others, these include the following:

- The evaluation system is used to achieve improvement and accountability;
- There should be a shared and valid concept of evaluation that is understood and valued by all participants;
- The evaluation approach is developed and defined by all stakeholders;
- There is continuous feedback on evaluation and its outcomes;
- There is continuity and flexibility;

- The system is workable within the organization;
- Evaluations should proactively guide decision making;
- There is demonstrated action and response after evaluation; and
- The evaluation system promotes the achievement of excellence throughout the organization.

The creation of an effective and usable program evaluation system is not an easy task in that it is a crosscutting management issue that involves numerous social, political, economic and technical dimensions. As a consequence, there is often a tendency to avoid program evaluations because they often require a high level of complexity and associated resources. In practice, the specifications and prominence of any evaluation system should cater for the nature of the program and its expected outcomes. Therefore, in order to maintain standards and quality, all programs should ensure that there is allocation of appropriate resources and time for evaluations. In general, the presence of an active and well-managed evaluation system provides a good indication that a program is destined for success (Aucoin 2005; USEPA 2006).

2.3 What Should be Evaluated and How Should it be Done?

Evaluation is a management process that is intrinsic to all individuals and organizations as they pursue a myriad of activities that require rapid judgement as to whether things are being done appropriately. Evaluations can involve informal personal or internal institutional processes or, in order to avoid bias and promote transparency, they can involve more sophisticated approaches such as formal external evaluations and documentation for public consumption. In terms of long-term multi-stakeholder initiatives such as ESSIM, there is a need to have a more formal evaluation approach that caters for the progressive nature of programs that may extend for long periods of time (Olsen 2003; Rubenstein 2006). Programs generally follow a logical progression of steps in which:

1. The need for the program is identified and objectives are set;
2. The resources are mobilized and actions are put in place;
3. Products and services are delivered; and
4. Outcomes and impacts occur.

Each of these steps requires evaluation in order to increase the chances of achieving the desired outcomes and impacts. Experience with evaluation practice has identified several applicable types of evaluation, each of which requires a different approach and perspective (Stufflebeam 2003). The main types of evaluation include the following:

- ***Context Evaluation*** assesses the needs, assets, and problems with a defined environment or resource. Evaluation is carried out in order to identify the status of issues, feelings and needs of stakeholders, priority aspects, desired outcomes, and the factors that might influence the success or failure of any initiative. Contextual evaluation is normally undertaken before a program is initiated and contributes to the selected objectives and goals for the forthcoming program.

- ***Input Evaluation*** is concerned with assessing the strategies, work plans, resources and budgets for a selected approach. This contributes to the selection of the most appropriate operational work plan by which objectives can be achieved and responsibilities and resources can be allocated.

- ***Process Evaluation*** monitors, documents and assesses the progress made on all of the program activities and the completion of products and outputs that have been agreed upon at the outset. It allows for an assessment of efficiency and performance in reaching milestones and producing products (hence performance evaluations), particularly where there are time scales linked to their delivery.

- ***Product and Output Evaluation*** is concerned with the evaluation of products and outputs that are generated during the course of a program. It involves the evaluation of the quality of a defined product or output (e.g., a plan, a guideline document, a piece of technology, a workshop, a forum meeting). There is need to distinguish between the terms *products and outputs* and *outcomes*. Products and outputs are related to the products of workable program processes, whereas outcomes are related to substantive goals of the process and are measured external to the program.

- ***Outcomes Evaluation*** assesses the quality and significance of the outcomes, as well as the program's effects on targeted stakeholders. It also includes the extent to which the program has been (or could be) adapted and applied elsewhere. All projects and programs invariably have unintended outcomes, both positive and negative, which are included in this category.

- ***Meta-evaluation*** assesses the value of evaluations and the extent to which evaluations have adhered to required standards for the program.

- ***Formative Evaluations*** are carried out during the active part of a program in order to determine how the program is doing while it is in progress, or taking form. Formative evaluation can also help identify issues of interest that might have been missed during early planning and it can help shape and refine data collection activities.

- ***Summative Evaluations*** are undertaken at the end of an agreed period of time in order to evaluate whether there should be continuation or change to the objectives or strategy.

Formative and summative program evaluations generally take an integrated perspective of the program by making use of combined contextual, input, process, product, and outcome approaches to provide a general overall evaluation.

These different evaluation types highlight the practicality that evaluation is not a one-off event, but rather a sequence of different evaluations that guide a program from conception through to conclusion, and in some cases far beyond. Each evaluation step takes cognizance of what is currently known and relates this to what is to be achieved based on the program's intended objectives and outcomes. Effective evaluation thus helps decision makers better understand the program, how it is impacting on participants, partner agencies and the community, and how it is being influenced/impacted by both internal and external factors.

Whichever the category of evaluation, there are common aspects that need to be addressed in each evaluation in order to establish a sound understanding of the scope. The scope of any evaluation is initially determined by formulating specific questions, notably:

1 Definition – How is the evaluation defined?

2 Purpose – What purposes will be served?

3 Values – What values will the evaluation be based on?

4 Questions – What questions will be addressed?

5 Information – What information is required?

6 Audiences – What persons and groups will be served by the evaluation?

7 Agents – Who will do the evaluation?

8 Process – How will the evaluation be conducted?

9 Products – What are the end products of the evaluation and how will they be disseminated?

10 Standards – By what standards will the evaluation be judged, e.g., utility, propriety, feasibility, and accuracy?

Formal evaluations normally follow a process containing four successive steps, notably preparation, assessment, evaluation, and reflection (Shephard 1977). The relationship of the steps is illustrated in Figure 1.

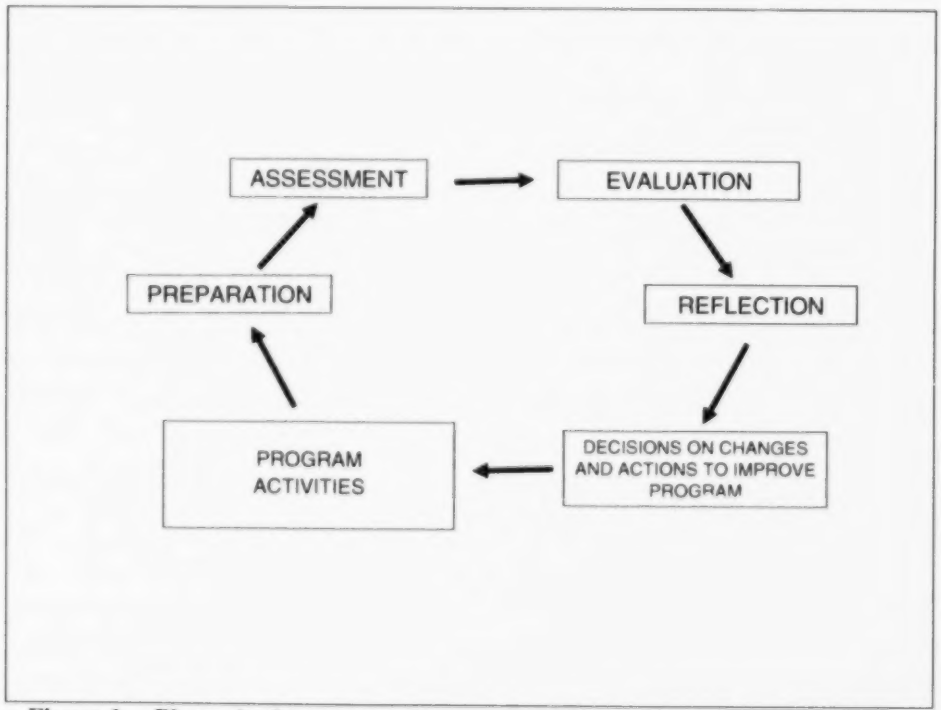


Figure 1.—Phases in the process of program evaluation (from Shephard 1977).

The **preparation phase** yields decisions on what is to be evaluated, the type of evaluation (e.g., formative, summative, process etc.) to be used, the criteria against which progress will be judged, and the most appropriate assessment strategies with which to gather information progress. The **assessment phase** involves information-gathering strategies, constructs and selects appropriate instruments for assessments, and collects and processes the required information. The **evaluation phase** involves feedback to relevant stakeholders, and the passing of judgement on progress and status. Finally, the **reflection phase** allows time to consider the successes and shortfalls of the evaluation and generates appropriate decisions on interventions to rectify and improve both program and evaluation activities.

2.4 What Makes a Successful Integrated Ocean Management Program?

One of the key aspects of program evaluation is the assessment of progress and status against success factors or program values (Stufflebeam 2003). These characterize the "approach and way" in which a program is carried out. Operational experience with the implementation of integrated marine management projects has led to the identification of many possible key factors (values) that can contribute to the success of any program (Stojanovic *et al.* 2004 – see Table 1).

While all the factors cited in Table 1 are important, it is likely that different programs will place greater emphasis on certain success factors. For the purpose of facilitating evaluation, it is important for any program to firstly identify the factors that will form the core program values, and that will be used to frame and scope the type of evaluations that will take place. Stojanovic *et al.* (2004) have identified the predominant factors that determine the success of ICOM programs (established from most frequent citations in ICOM reports). These include the following:

- **Comprehensive:** concerns taking a sufficiently wide scope and full view of issues;
- **Participatory:** ensures that there are opportunities for common contribution and balanced sharing of activities;
- **Co-operative:** stakeholders operate together and are coordinated;
- **Contingent:** local variations in strategy, environment or tasks are catered for;
- **Precautionary:** denotes an approach where activities are undertaken in advance to protect against possible danger or failure;
- **Long term:** takes into account that environmental management needs more than brief views of environmental circumstances to understand and manage the links between the human and natural environment;
- **Focused:** relates to structured consideration of problems;
- **Incremental:** recognises that management is an iterative process that proceeds in a step-by-step manner; and
- **Adaptable:** relates to the capacity to adjust or alter activities so as to deal with new situations.

It is important at the outset of any program that key success factors or program values are collectively defined and agreed upon by stakeholders so that these factors can become an integral part of program activities and their evaluation. This is depicted in Figure 2, which shows how program values relate to the different types of evaluation.

Table 1. —Factors for Successful ICOM (from Stojanovic *et al.* 2004)

Factors	Sub-factors	Factors	Sub-factors
1. Accountability		25. Interdisciplinary	
2. Adaptivity		26. Inventiveness	Innovation
3. Co-operation	Co-ordination, collaboration	27. Learning	
4. Comprehensiveness (geographical)		28. Legitimacy	
5. Comprehensiveness (interests)	Representative	29. Long termism	
6. Comprehensiveness (relevant issues)		30. Monitoring/ assessment	
7. Conciliatory		31. Multidisciplinary	
8. Consistency	Harmonisation	32. Networking	
9. Contingency		33. Participation	Pluralism
10. Education	Training	34. Practical application	Implementation
11. Effectiveness		35. Precautionary	
12. Efficiency		36. Proactive	
13. Enforcement		37. Productivity	
14. Equity		38. Quality	
15. Ethical		39. Rationality	
16. Flexibility		40. Relevance	
17. Focusing		41. Responsibility	
18. Government backing	Political support, public awareness	42. Scientific Input	
19. Holism		43. Structure of decision-making	
20. Incrementalism		44. Subsidiarity	
21. Institutional issues	Governance capacity	45. Sustainability	Maintenance
22. Instruments and policies		46. Transparency	
23. Integrated knowledge		47. Technical capacity	
24. Integration			

ESSIM has identified a number of guiding principles (ESSIM Planning Office 2005), several of which relate to the success factor the same as those cited by Stojanovic *et al.* (2004), notably:

- Integrated management;
- Ecosystem-based management;
- Sustainable development;
- Precautionary approach;
- Multiple use management;
- Conservation;
- Collaboration;
- Adaptive management; and
- Stewardship.

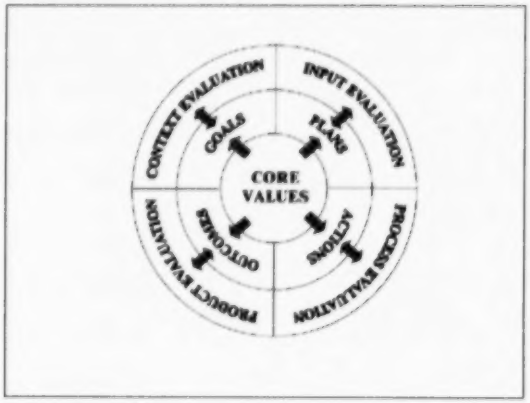


Figure 2.—Relationship between program core values (success factors) and the different types of program evaluation (from Stufflebeam 2003).

The ESSIM operating principles for its collaborative planning model (DFO 2005) also provide success factors and core values against which evaluations can be made:

- ***Jurisdiction:*** management authorities and jurisdiction of government departments and agencies is acknowledged and affirmed;

- ***Inclusion:*** all stakeholders are included;

- ***Consensus:*** decisions and recommendations are made by consensus and the process includes mechanisms for dispute resolution;

- ***Accountability:*** accountability is expected of and demonstrated by all parties;

- ***Evolution:*** the process is designed to permit and support evolution and will be monitored and evaluated to support shared learning and adaptation;

- ***Networking:*** the process will continue to work through a network of stakeholders;

- ***Transparency:*** decisions and recommendations are made openly, with information and results shared with all stakeholders;

- ***Efficiency:*** issues are addressed in a timely manner; and

- ***Knowledge-based:*** *decisions and recommendations are based on best available information.*

There is a need for ESSIM to confirm those guiding and operating principles, which are indeed core principles upon which program activities should be evaluated and assessed.

2.5 What Approaches are Used to Assess Progress in Integrated Coastal and Ocean Management?

There has been wide international concern expressed about the general lack of knowledge concerning the status of coastal and ocean management initiatives throughout the world (Olsen 2003; IOC 2005a). This is because very few initiatives have actually incorporated meaningful and effective evaluation systems into their operations (Olsen 2003). Consequently, over the last decade there has been considerable effort devoted towards the development of approaches on the implementation of integrated coastal and ocean management (ICOM), as well as for evaluating progress and performance. Some examples include:

- Olsen, Lowry and Tobey (1999): A Manual for Assessing Progress in Coastal Management. Coastal Resources Center, University of Rhode Island. Coastal Management Report # 2211.

- University of Delaware (2002): The Role of Indicators in Integrated Coastal Management Ottawa, April 29–May 1, 2002 Workshop Report. www.udel.edu/CMS/csmp/indicators 19 pp.

- Olsen (2003): Frameworks and Indicators for Assessing Progress in Integrated Coastal Management Initiatives. *Ocean and Coastal Management* 46 (2003): 347–361.

- UNESCO (2003): A Reference Guide on the Use of Indicators for Integrated Coastal Management - ICAM Dossier 1, IOC Manuals and Guides No. 45. UNESCO, Paris.

- Pomeroy, Parks and Watson (2004): A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness. IUCN – The World Conservation Union. 214 pp.

- IOC (2005a): A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management – Preliminary Version. IOC Manuals and Guides 46. UNESCO, Paris.

- IOC (2005b): User Guide to the Test of IOC ICOM Indicators. Draft Document. IOC User Guides. UNESCO, Paris.

The IOC (2005a) recommends that evaluation of progress and performance should be based on the monitoring of tasks and outcomes that are associated with a series of six successive iterative steps (see Figure 3). The progress is based on the successful completion of identified tasks, while performance is based on the time-scale within which the tasks were completed. To this end, the IOC (IOC 2005a) has advocated the use of several categories of attributes that can be used to describe qualitative and quantitative aspects of projects. These are related to numerous ecological, governance, and socio-economic attributes (see Annex 1). Associated with these attributes are numerous quantitative and qualitative indicators that are recommended for use in evaluating progress and status.

The selection of indicators is dependent on the context and stage of the marine resource program that is to be evaluated.

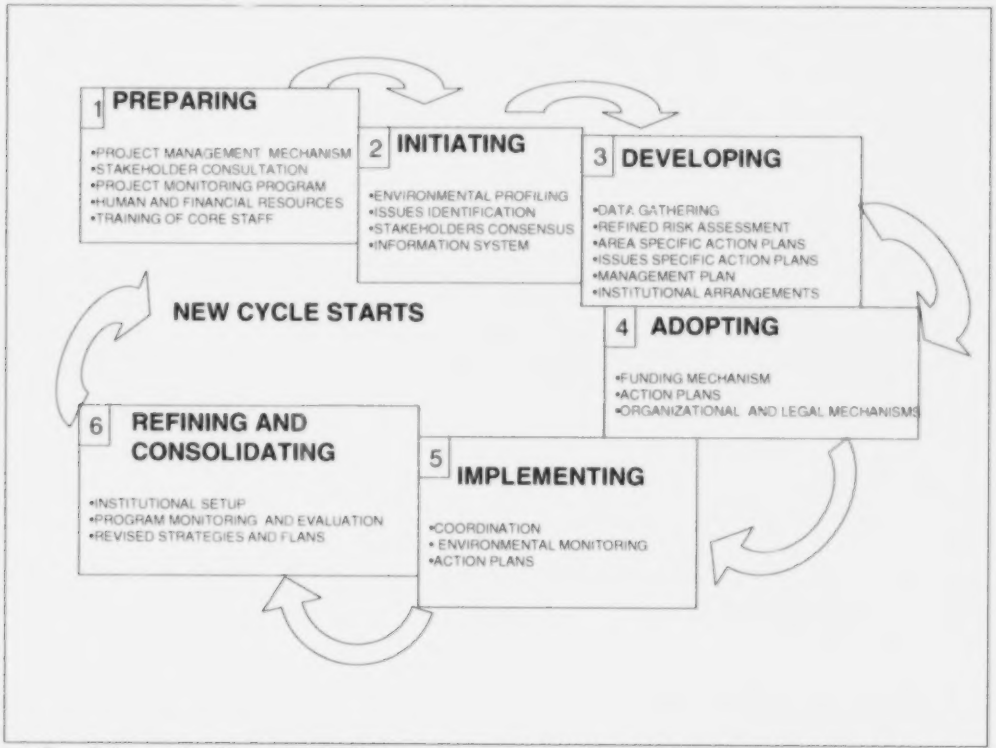


Figure 3.—Schematic diagram outlining six main steps in the implementation of ICOM (from Chua *et al.* 2003)

2.6 What are Some of the Key ICOM Evaluations that Have Been Done in Canada?

At the Canadian national level there have been several formal public evaluations of ICOM-related activities based on DFO's performance in implementing policy and legislated commitments of the *Oceans Act*. The first was carried out by a parliamentary standing committee on Fisheries and Oceans (Standing Committee on Fisheries and Oceans 2001), which provided general comment on the *Oceans Act* and how it should be implemented.

The CCESD (2005) parliamentary report on the performance of the DFO makes specific reference to the performance gap between policy, plans and achievements in implementing ICOM practices. The CCESD based its evaluation on criteria that it expected the DFO to have completed, notably:

- Have clear plans and results expectations—including reasonable timetables, deadlines, and costs—for its responsibilities under the *Oceans Act*, Part II, Oceans Management Strategy; its responsibilities related to oceans management in *Canada's Oceans Strategy*; its oceans commitments in its *Sustainable Development Strategy*; and Canada's international oceans commitments for which the Department has responsibility, in particular, the World Summit on Sustainable Development commitments.

- Lead and facilitate the development and implementation of a national oceans strategy, based on the ecosystem approach and the principles of sustainable development, integrated management, and the precautionary approach.

- Lead and facilitate the development and implementation of policy and plans for the integrated management of Canada's oceans, including a national system of marine protected areas.

- Have reliable and timely information on the key environmental, social, economic, and institutional risks associated with the oceans and their use; and use this information in setting priorities and allocating resources for its integrated oceans-management, science, monitoring, and enforcement activities.

- Implement, as appropriate and in a reasonable time, the oceans management recommendations made by the Standing Committee on Fisheries and Oceans.

- Measure, report, and account for its performance and the results achieved from its oceans management responsibilities and commitments; and provide this information to management and Parliament on a timely basis.

On the basis of the audit, the CCESD identified some of the main shortcomings, including the following:

- Implementing the *Oceans Act* and subsequent oceans strategy has not been a government priority. After eight years, the promise of the *Oceans Act* is unfulfilled. Fisheries and Oceans Canada has fallen far short of meeting its commitments and targets: it has finalized no integrated management plans and has designated only two marine protected areas.

- The Department has had difficulty developing and implementing a workable and consistent approach to integrated oceans management. As a result, arrangements are not yet in place to resolve increasing conflicts among users of the oceans over access to space and resources.

- Parliament has not been given the financial and other performance information it needs to hold the Department accountable for its *Oceans Act* responsibilities. Nor has the Department met its commitment to report periodically on the state of the oceans.

- The new oceans action plan is the government's framework for sustainably developing and managing our oceans. However, it does not address all the barriers to implementing a national oceans strategy. These include the need for strong leadership and co-ordination over the long term, adequate funding, and an accountability framework with appropriate performance measures and reporting requirements.

The report provided comments on the status of ESSIM and other Canadian ICOM initiatives (see Table 2). The 2005 CCESD assessment was based on the status of the ESSIM initiative in terms of meeting DFO federal commitments, and did not deal with the achievements of objectives as a program.

Table 2.—Evaluation Comments on ESSIM by the Canadian Commissioner for Environment and Sustainable Development (adapted from CCESD 2005)

EVALUATION CRITERIA	ESSIM STATUS	COMMENTS
Define and assess the management area	Some progress	The area is being redefined to full Scotian Shelf
Engage affected interests	Satisfactory progress	Extensive consultations have been conducted
Develop an integrated management plan	Some progress	A draft plan has been developed, and consultations are ongoing
Endorse the plan	Limited or no progress	No plans exist
Implement the plan	Limited or no progress	No plans exist
Monitor, evaluate, report and revise the plan	Limited or no progress	No progress

There has also been a process of internal review by the DFO Oceans Management Steering Committee, which in 2003 conducted a fairly rigorous review of the effort that DFO Maritimes Region has devoted to implementing the *Oceans Act* over the period 1997 to 2003 (Oceans Management Steering Committee, 2003). This did not specifically involve progress or evaluation of ESSIM, apart from mentioning that the initiative was in progress. Furthermore, the review was not strictly a formal evaluation, but rather an internal DFO assessment (inventory) of the status of implementation of the *Oceans Act*.

ESSIM has not yet reached the stage where its stakeholders are actively and formally involved in monitoring and evaluating the performance of the initiative. Indicators are currently being developed as part of the plan and an operational monitoring and evaluation system is still to be developed. To date, there has been no formally recognised evaluation of ESSIM by stakeholders; however, there has been ample opportunity for stakeholders to provide comment through a variety of transparent communication channels, which have included: open forum meetings, public participation workshops, and internet discussion sites etc.

The Canadian Auditor General (CCESD 2005) has commented on the absence of a formal performance evaluation and reporting system for implementation of the *Oceans Act*. This is not surprising as there are many aspects that hinder the development of a workable system. Rubenstein (2006) has outlined some of the problems and issues that are associated with implementing collaborative ocean governance in Canada. He has highlighted four main areas that pose challenges, especially for the development of a meaningful system for evaluation and performance:

1. The transaction costs in terms of participation and coordination;
2. Internal commitment, collaboration and cooperation within the lead agency;
3. Accountability within participating governance structures; and
4. Capacity, competence and commitment by participating stakeholders to achieving integrated management.

The development of an evaluation system for ESSIM is, therefore, a task that will pose a challenge to its stakeholders, particularly as there is limited experience in the formal evaluation of regional ICOM initiatives in Canada.

2.7 How are Indicators Developed and Used in Evaluation?

Evaluations and assessments are based primarily on providing qualitative and quantitative answers to questions that decision-makers (stakeholders) wish to know about at a particular stage of a program (Stufflebeam 2003). Answers to questions are provided by using indicators, which are defined by the IOC (2005a) as "measured or observed parameters that provide information about a system." Indicators are used in evaluations to provide both quantitative and qualitative descriptions of certain attributes/values/questions that are important for stakeholders to know about (see examples in Annex 2).

The development and selection of indicators for program evaluation follows an iterative process in which:

1. Contextual evaluation makes use of information and opinion to describe the status of environmental resources and highlights what needs to be changed. Stakeholders then develop program objectives that provide a reflection of what the program intends to change and the expected outcomes. This process allows for the identification of **outcome indicators**, which are used to assess the degree by which the intended changes have been effected. Monitoring of these indicators then provides information that is used in outcome evaluations.

2. Strategies and action plans to achieve each of the objectives are developed to include information on: resources to be used, activities to be undertaken, products and outputs and their timing, finances, personnel, accountability, and responsibilities etc. The information from this provides indicators that are used in input evaluations to assess whether the proposed objectives can be achieved based on the resources that are to be allocated. The information is also used in process evaluations to assess whether project milestones (deadlines for products and outcomes) have been met.

3. Prior to any formal evaluation, decision-making questions for the program are posed (ideally by stakeholders – see examples in Annex 2). These will depend on the type of evaluation to be carried out (e.g., contextual, process, input, product, and summative, etc.) and relate to the strategy and action plan. Many of the questions will also serve to direct research and monitoring activities that support the provision of information for the evaluation process.

4. Indicators are then selected and tested on the basis of how well they answer each of the questions (see examples in Annex 2).

5. A report is then prepared by an evaluator, which attempts, as far as is possible, to provide answers to all of the evaluation questions. This is done by making use of selected indicators for which there is information.

6. Stakeholders and decision-makers then assess the report in terms of its findings, as well as its adequacy in answering the questions. This assessment process assists in identifying gaps in monitoring, confirms the usefulness of selected indicators, refines the initial evaluation questions, and also allows for the feasibility of a particular objective to be reviewed.

7. The process then continues iteratively and in this way a set of indicators is built up for the program.

It is important to recognise that indicators and evaluations are intimately linked in that it is not possible to carry out any meaningful evaluation without identifying the indicators that are to be used in making judgements. Evaluation is therefore an important management component of ICOM in that it serves to identify and guide the selection of indicators for which information is to be collected during the course of a program. Accordingly, evaluation and reporting should be introduced into projects at an early stage so that associated indicators can be identified as early as possible to fulfil their intended use in evaluating future aspects of the program.

There are numerous indicator frameworks that have been used for purposes of organizing information and reporting systems for programs and natural resources (IOC 2005a; IOC 2005b). Two examples of relevant ones that might be useful for the purposes of ICOM are:

The Driving Force, Pressure, State, Impact, Response (DPSIR) framework has become regularly used for state of the environment reporting (e.g., European Environmental Agency 2006 – see Figure 4). The framework makes use of several categories of indicators, which describe the status of key issues that are relevant to the natural environment. The framework assumes cause-effect relationships between interacting components of social, economic, and environmental systems, which are as follows:

- **D**riving forces of environmental change (e.g., industrial production)
- **P**ressures on the environment (e.g., discharges of waste water)
- **S**tate of the environment (e.g., water quality in rivers and lakes)
- **I**mpacts on population, economy, ecosystems (e.g., water unsuitable for drinking)
- **R**esponse of the society (e.g., watershed protection)

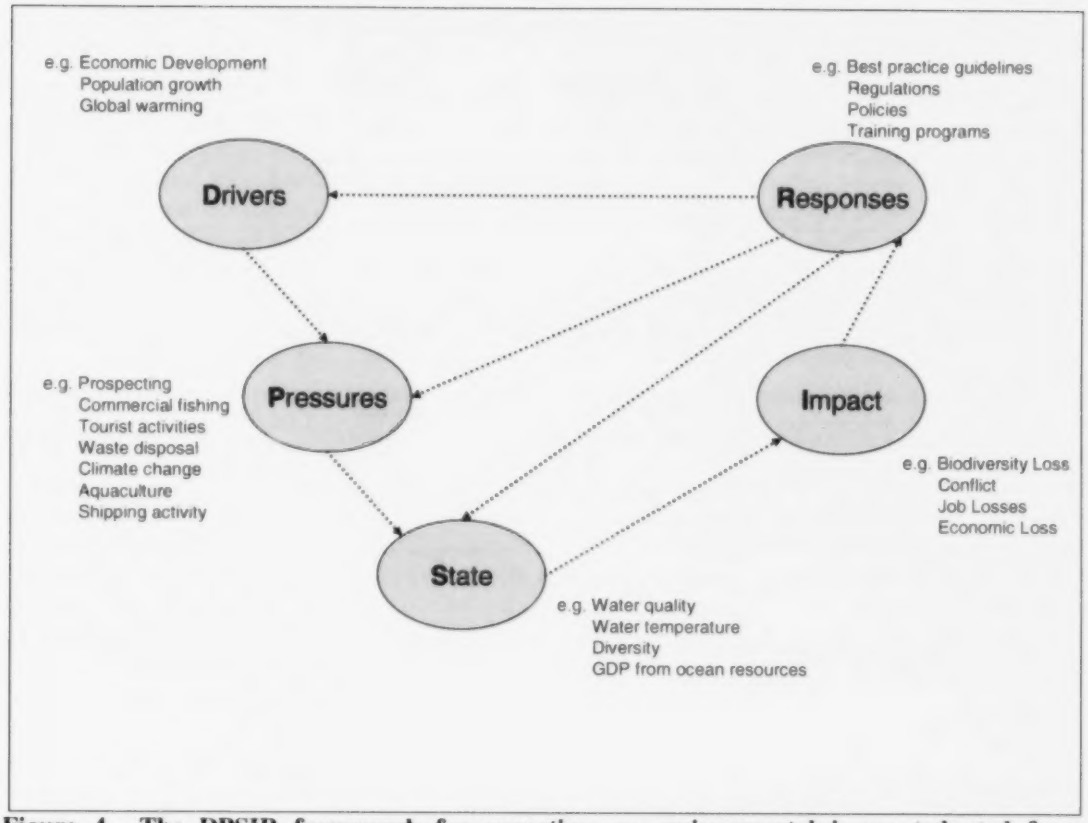


Figure 4.—The DPSIR framework for reporting on environmental issues (adapted from European Environmental Agency 2006). Indicators describing Drivers, Pressures, State, Impact and Response are used to assess the status of resources and sustainable development issues.

The Logical Framework Analysis (LFA) associates indicators with program/project objectives, and also identifies activities and outputs that have associated indicators and means of verification (Leeuw 2000; see Table 3).

In the case of ICOM, the LFA approach can be applied to project-related activities and outcomes, whereas the DPSIR is more applicable to assessing the state of ocean resources and providing descriptions of specific problem issues and their causes. The two frameworks link up, as most LFA activities (and indicators) are related to responses in the DPSIR framework.

As neither of these frameworks will singly satisfy the requirements for all program evaluations, it is recommended that both types of approach should be used as a means to develop and organize indicators for reporting in the most logical manner (World Water Assessment Program 2003; IOC 2005b). The LFA framework is useful for input, process and project outcome evaluations, whereas the DPSIR is more applicable for contextual and also outcomes evaluations.

Table 3.—Example of a Log Frame Table with its associated elements (from Leeuw 2000).

Objectives	Measurable Indicators	Means of Verification	Important Assumptions
Goal: Wider problem the project will help to resolve	Quantitative or qualitative ways of measuring judging timed achievement of goal.	Sources, which provide evidence of achievement through the indicators.	External factors necessary to sustain the achievement of objectives in the long run.
Purpose: The immediate impact on the project area or target group i.e. the change or benefit to be achieved by the project	Quantitative or qualitative ways of measuring judging timed achievement of purpose.	Sources, which provide evidence of achievement through the indicators.	External conditions necessary if achieved project purpose is to contribute to reaching project goal.
Outputs: The specifically deliverable results expected from the project	Quantitative or qualitative ways of measuring judging timed production of outputs.	Sources, which provide evidence of achievement through the indicators.	Factors out of the project's control that might restrict progress for outputs to achieve project purpose.
Activities: The tasks to be done to produce the outputs	**Inputs:** Summary of project budget	Financial statements	Factors out of the project's control that might restrict progress for activities to achieve project outputs.

3. WHAT ARE THE DIMENSIONS OF ESSIM THAT NEED EVALUATION?

The starting point for developing a successful integrated management plan for ESSIM hinges on understanding and defining the issues that are important in the proposed management area. Although ESSIM is a regional Atlantic Ocean management initiative that relates mainly to the Provinces of Nova Scotia and Newfoundland, there are also many other aspects that pertain to meeting the requirements and obligations of sustainable and integrated ocean resource management. The ESSIM initiative provides a representative microcosm from which progress towards meeting numerous international, federal, provincial and local obligations can be evaluated and assessed.

3.1 Some of Canada's International Commitments

Canada, by endorsing specific United Nations international environmental treaties and agreements, has numerous international commitments that can only be met through ensuring that initiatives such as ESSIM are successfully implemented. The Johannesburg Plan of Implementation (JPI), an outcome of the UN 2002 World Summit on Sustainable Development, contains specific goals and targets that countries should strive to achieve in their management of marine resources (United Nations 2002). Canada, as a signatory to the JPI, has committed itself to fulfilling specified actions that have particular relevance to ESSIM, and for which objectives and performance measures apply. Some of these include:

- Implement the 1982 United Nations Convention on the Law of the Sea, which provides the overall legal framework for ocean activities;
- Promote the implementation of Chapter 17 of Agenda 21;
- Encourage the application by 2010 of the ecosystem approach;
- Maintain or restore fishery stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015;
- Implement the 1995 FAO Code of Conduct for Responsible Fisheries. Canada has a Code of Conduct for Responsible Fisheries and its application in an ocean area such as ESSIM is important in terms of assessing and monitoring performance;
- Eliminate subsidies that contribute to illegal, unreported and unregulated fishing and to over-capacity;
- Support the sustainable development of aquaculture, including small-scale aquaculture;
- Maintain the productivity and biodiversity of important and vulnerable marine and coastal areas;
- Develop national, regional and international programmes for halting the loss of marine biodiversity, including in coral reefs and wetlands;
- Develop and facilitate the use of diverse approaches and tools for integrated coastal and ocean management;

- Advance implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and the Montreal Declaration on the Protection of the Marine Environment from Land-based Activities;

- Enhance maritime safety and protection of the marine environment from pollution; and

- Improve the scientific understanding and assessment of marine and coastal ecosystems as a fundamental basis for sound decision-making.

The proximity of the ESSIM area to the United States of America, coupled to the notion that the ESSIM area could be extended (e.g., to cover the whole of the Scotian Shelf or for continuity with ocean management areas in the Bay of Fundy and the Gulf of Maine), means that there may be important transboundary implications for the way in which certain ocean areas and their resources should be evaluated and managed.

3.2 The Federal Government's Commitments to Integrated Oceans Management

Canada has been one of the lead countries in the global effort to develop and promote ways to improve sustainable development in the ocean environment. This is evidenced by the logical approach that has been taken in implementing Chapter 17 of Agenda 21 after the 1992 Rio de Janeiro UN Earth Summit. Chronologically, progress has included the following:

1994 The preparation of a national policy on ***A Vision for Ocean Management*** that highlighted the need for oceans management strategy and oceans legislation.

1995 An ***Auditor General's Act*** that created the position of Commissioner of the Environment and Sustainable Development (CCESD) and formally added an environmental element to the reports of the Auditor General to the House of Commons. In addition, it mandated that the Ministers of 23 federal departments should table sustainable development strategies in the House of Commons by December 1997 and update these strategies every three years. A federal level assessment of progress and performance on all of these strategies now forms a routine part of the Auditor General's reports to parliament.

1997 Canada's ***Oceans Act*** designated the DFO as the lead agency and facilitator for the implementation of an oceans management strategy.

1997 DFO's first ***Sustainable Development Strategy*** identified coastal and oceans priority issues and actions that required attention over the period 1998 to 2000.

1998 Three local area marine management zone initiatives (ESSIM, Pacific North Coast, and the Beaufort Sea) were launched to pilot and apply ICOM approaches to marine and coastal management in Canada.

1999 A ***Policy and National Framework for Establishing and Protecting Marine Protected Areas*** that presented the general approach to be followed in establishing and managing Marine Protected Areas (MPAs) across Canada.

2001 DFO's second ***Sustainable Development Strategy (2001–2003).***

2002 DFO's ***Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada*** proposed an operational framework for

governance, management by areas, design for management bodies and the type of planning processes that could be involved. It specified the Integrated Management planning process to be followed in Canada, which included six inter-related stages, notably: defining and assessing a management area; engaging affected interests; developing an Integrated Management Plan; receiving endorsement of the plan; implementing the plan; and monitoring and evaluating outcomes.

2002 ***Canada's Oceans Strategy*** specified 55 existing and new management activities to be implemented over a four-year period by the approximately 20 federal departments and agencies involved.

2005 The acceptance of ***Canada's Oceans Action Plan*** that outlines actions to be undertaken for integrated management plans for large ocean areas on all three coasts. The focal issues have been identified as international leadership and sovereignty, integrated oceans management, health of the oceans, and oceans science and technology.

ESSIM is one of many activities that have emerged as contributions to the implementation of federal policy and regulations on integrated coastal and oceans management (primarily the *Oceans Act*) and is part of an ongoing program (see *Canada's Oceans Strategy* with its 55 envisaged activities – DFO 2002a). There are three basic principles upon which the *Oceans Act* is based, and to which initiatives such as ESSIM should subscribe (Rubenstein 2006). These are:

- How well it contributes to integrated management;
- How it implements the precautionary principle; and
- How it contributes to sustainable development.

Evaluations of initiatives such as ESSIM should, therefore, be geared to contributing answers to questions such as those posed by Rubenstein (2006) – see Table 4. Assessments of progress and performance for ESSIM also contribute to higher-level assessments of national progress in implementing federal commitments.

Table 4.—Some key questions that decision-makers and stakeholders require answering at the national level in terms of the *Oceans Act* and its implementation (from Rubenstein 2006).

Integrated Management and Collaboration	Precautionary Principle	Sustainable Development
• Have the costs of collaboration been exceeded by the benefits? What are the benefits? • Has there been less conflict over ocean use? • Is there adequate federal leadership that results in a coherent interdepartmental oceans policy and program? • Have the federal government and provinces worked effectively to manage all sources of marine pollution and degradation including land-based activities? • Are federal decisions on fisheries, oil	• Have there been collapses of species and habitats? • How do we know we have erred on side of caution in protecting sensitive marine habitat? • How do we know whether the federal government has erred on the side of caution on major ocean investment decisions? • Have declines in marine environmental quality been halted/arrested?	• Is there now a consistent, stable and coherent regulatory (and investment) climate across all of Canada's ocean spaces? • Have there been any collapses of coastal communities? • Is Canada becoming a world leader in seizing ocean opportunities, creating innovation in marine industries? • Has intelligent investment occurred that has respected

and gas made in an integrated manner?		sensitive marine habitat, not resulted in further increases in cumulative environmental effects?

3.3 Provincial and Local Issues

Ocean resources play a major role in the economy and social fabric of the Maritime Provinces (Gardner Pinfold Consulting Economists 2005). Local stakeholder interests include the following:

- Fishing industry;
- Oil and gas activities;
- Commercial shipping activities;
- Tourism and recreation;
- Maritime defence operations;
- Communications systems with submarine cables;
- Marine science and technology; and
- Marine conservation interests.

In addition, there are numerous federal-provincial, provincial, and local agencies that have some form of jurisdiction (direct and indirect) or interest in marine resources of the ESSIM area (Chao *et al.* 2002). In light of the intentions to incorporate social and economic dimensions to the ESSIM Plan, the initiative will not only involve management of ocean resources, but also land-based activities that are dependent on utilisation of ocean resources. There are numerous issues (provincial, business and local) that have been identified as being important and which ESSIM can address (ESSIM Planning Office 2002). These issues are covered by the 28 ESSIM objectives that have been developed through consultation with ESSIM stakeholders (see Annex 2).

4. APPROACHES TO EVALUATING THE ESSIM PLAN

The evaluation system to be used by ESSIM has many challenges that need to be addressed. Some of these include the following:

- The ESSIM initiative is essentially a multi-stakeholder coordination mechanism with the main objective of implementing integrated management approaches in a designated ocean area. The evaluation system will need to examine the coordination aspect and the impact this has on promoting the practice of integrated management.

- ESSIM is perceived by many as being a pilot initiative with the objective of developing and testing ICOM procedures, as well as an initiative that is involved in improving management of a marine area. Evaluation should cater for both contributions.

- The ESSIM plan has numerous phases that have considerable overlap. It will be necessary to recognise these phases (with their associated outcomes) and the extent of overlap when designing and carrying out evaluation.

- ESSIM evaluation will have to cater for (and separate) the multiple roles of DFO in not only facilitating the initiative, but also in contributing to fisheries management, habitat management, and scientific assessment and advice.

- Evaluation can be complex and also extremely time-consuming. In view of the limited human resources directly available, there will be a challenge to ensure that an optimal level of evaluation is applied to the program, without this becoming burdensome and unproductive.

- There is a need to evaluate performance and status against guidelines and strategies that have been previously developed for implementation of the *Oceans Act* (e.g., see DFO 2002a; 2002b).

- ESSIM has numerous participants who have formally recognised that they have a role to play in developing and implementing ICOM, particularly member institutions of the lead coordinating entities (Regional Committee on Ocean Management (RCOM) and the Stakeholder Advisory Council (SAC). The introduction of integrated management approaches requires the presence of political and institutional leadership, which provides one of the main driving forces to ensure implementation. Evaluation should, as far as is possible, include all levels of participation (e.g., political, managerial, technical, and institutional).

- The approach to evaluation should be transparent, active, collaborative, credible, and above all be seen to contribute to decisions that lead to improvement of ESSIM and the integrated management of the ESSIM area.

- There will be many inputs, products and outcomes that are not necessarily directly associated with ESSIM, and evaluations will have to distinguish between these.

4.1 Using Canada's Policy and Operational Framework for Integrated Management of Marine Environments

ESSIM represents a component of a federal program that is designed to implement integrated oceans management (DFO 2002a). Accordingly, there is a guideline document that proposes how integrated

management of marine environments should be pursued in Canada (DFO 2002b). It thus follows that an evaluation system for ESSIM should be based on assessing the effectiveness and efficiency of ESSIM in applying these guidelines.

DFO's *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* (DFO 2002b) provides descriptions of six stages that cover the lifespan of ICOM initiatives in Canada. The six stages provide a logical framework for evaluation of ESSIM activities. These stages are outlined below:

1. Defining and Assessing the Management Area

This stage is concerned with activities that characterize the management area according to its ecological, economic and social attributes. It involves identifying the ecosystems involved and defining relevant ecosystem-based management objectives. It also includes scoping the issues and priorities that need to be addressed by the planning process, along with the interests and parties who need to be involved. Assessment of available information and knowledge, including scientific and traditional knowledge, is a prerequisite to providing a sound and logical basis for all other stages.

2. Engaging Affected Interests

Participation by a diverse range of parties is required, because of their roles in decision-making or with an interest or specific knowledge about the management area. Some of the sectors that have been identified include the following (DFO 2002b):

- National, regional and local management authorities;
- Aboriginal organizations and communities;
- Coastal and ocean industries and resource user groups;
- Non-governmental organizations;
- Community groups;
- Individual citizens; and
- Representatives from the academic, scientific and research community.

This stage should also include the establishment of coordinating and governance mechanisms with representative management bodies, with agreed mandates, composition and rules of operation. The process of identifying roles, responsibilities and commitments to action for stakeholders, both within and outside of government, is important.

3. Developing an Integrated Management Plan

The development of an integrated plan requires consideration of numerous elements, including the following:

- The defined area of application;
- Management structure and process;
- Management objectives for the area (ecosystem-based, social and economic);
- Recommended management actions including any conservation actions linked to the establishment of marine protected areas;
- Monitoring and performance evaluation actions; and
- Institutional arrangements.

4. Endorsement of Plan by Decision-Making Authorities

One of the key principles of integrated management and planning is that each participant retains authorities and responsibilities. Federal, provincial and territorial government departments, local and Aboriginal authorities will continue to be responsible within their respective jurisdictions where appropriate. The difference is that all participants agree to carry out respective responsibilities in accordance with the plan. It is envisaged that Plans will need to be reviewed and endorsed by the responsible mandated authorities.

5. Implement the Integrated Management Plan

Key components of successful implementation are as follows:

- Leadership and facilitation by the overall coordinating body formed under the integrated management planning process;
- Adequate funding, time and resource requirements identified for each phase of the plan;
- Appropriate reporting structures to ensure that plan objectives are met by participants, and that there is a high degree of compliance with the Plan; and
- The participation of industry and the broader oceans community in the process.

6. Monitor, Evaluate, Report and Revise Integrated Management Plan

The Canadian *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* (DFO 2002b) strongly emphasises the importance of a practical performance evaluation framework to assess results. It follows that one of the key elements of ESSIM will be the presence of an active and rigorous evaluation system that is used by stakeholders to guide the development and achievement of the necessary objectives and outcomes.

A shortcoming of the operational guideline is that monitoring and evaluation is promoted as being a summative exercise carried out in the final stage of the process rather than one that is introduced at the beginning. There have been comments from numerous stakeholders about the slow progress made in the development of the ESSIM Plan – an aspect that might have been catered for, had there been an evaluation (involving all categories of evaluation types) and monitoring of initial activities from the outset (see also CCESD 2005). It is possible to demonstrate how specific evaluation types relate to the DFO (2002b) operational framework (see Figure 5).

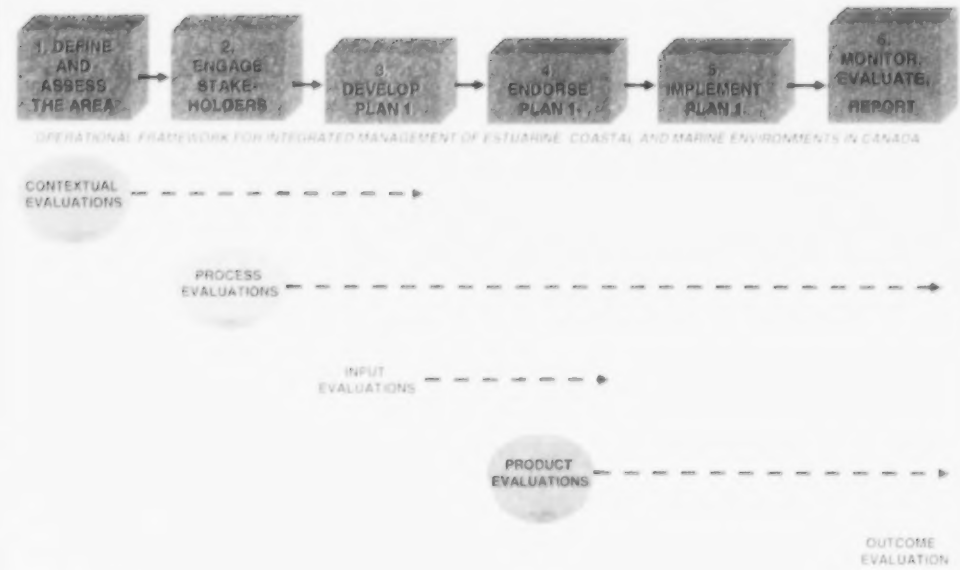

1. DEFINE AND ASSESS THE AREA
2. ENGAGE STAKE-HOLDERS
3. DEVELOP PLAN 1
4. ENDORSE PLAN 1
5. IMPLEMENT PLAN 1
6. MONITOR, EVALUATE, REPORT
OPERATIONAL FRAMEWORK FOR INTEGRATED MANAGEMENT OF ESTUARINE, COASTAL AND MARINE ENVIRONMENTS IN CANADA
CONTEXTUAL EVALUATIONS
PROCESS EVALUATIONS
INPUT EVALUATIONS
PRODUCT EVALUATIONS
OUTCOME EVALUATION

Figure 5. Different categories of evaluation associated with the six phases of the DFO operational framework.

Some points that require emphasis are as follows:

- The different evaluation categories can be associated with the six phases of the DFO operational framework.

- There is no such thing as a "single" evaluation within any of the categories, but rather a series of continuous evaluations. Each evaluation, when undertaken, will require specifications that are defined and agreed upon by the stakeholders.

- Summative evaluations, which are normally conducted after an agreed period of time (several years), will require integrated assessments involving elements of all evaluation categories.

- Although Figure 5 depicts that there is also an anticipated logical sequence to the evaluation categories, it is likely that aspects of all of the categories will persist throughout the initiative. Therefore, each evaluation category will require its own program of activity, depending on how ESSIM is progressing.

- An evaluation system for ESSIM should also relate to the individual objectives of the plan, actions, products and outcomes (i.e., for governance, human uses (social/economic) and ecological). The different evaluation categories can be related to these as shown in Figure 6.

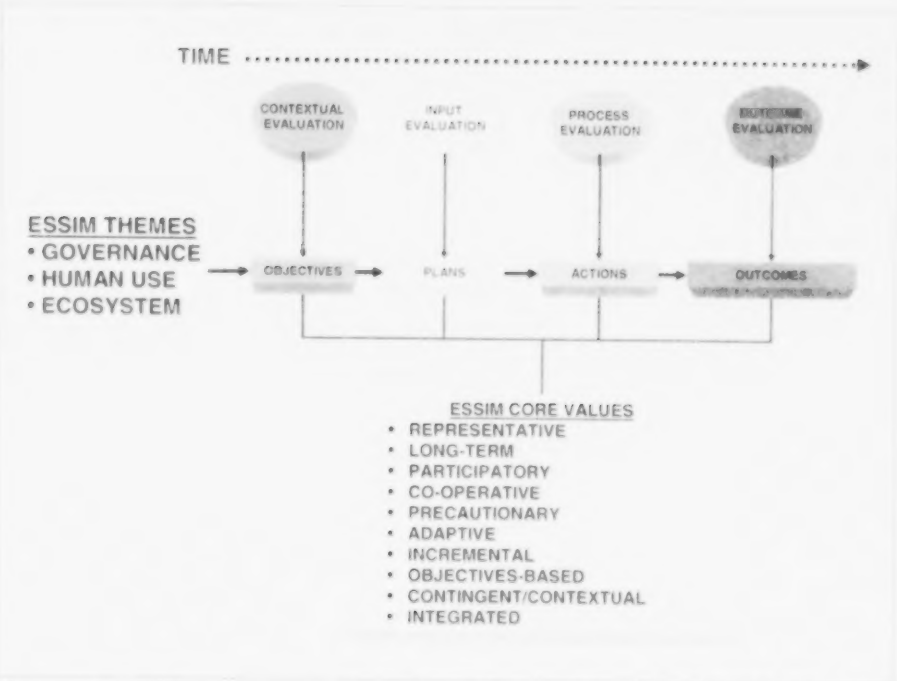


Figure 6. Different categories of evaluation associated with the objectives, implementation plans, actions and outcomes for ESSIM.

- The overall framework should be iterative in that product evaluations will invariably lead to new insights on context, with subsequent changes to objectives and activities. Therefore Plan 1 in Figure 5 will progress to modified Plan 2, and then to modified Plan 3 with successive evaluations.

- The psychological challenge to ESSIM is not to get impeded and make little progress because plans are not perfect or incomplete. The overall evaluation process should continually identify where flaws and gaps occur and attempt to correct and improve on these over time.

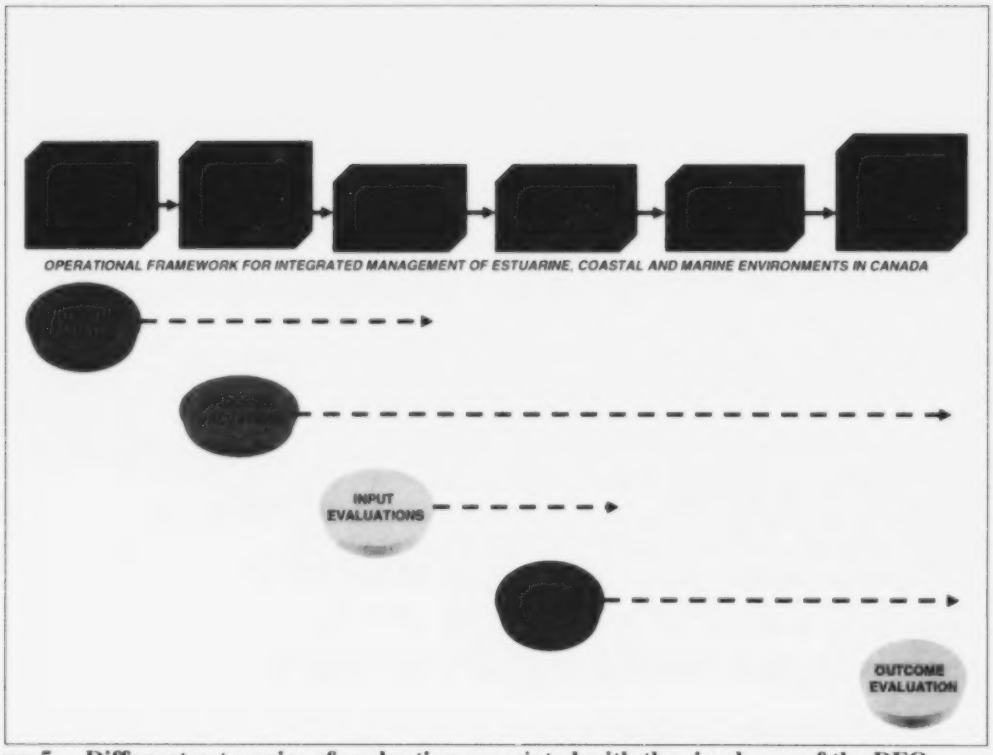
- Although ESSIM has been underway for over seven years, and the initiative has reached the stage of a draft Plan, there is still opportunity for the early stages to be retrospectively evaluated and assessed.

- It is important that evaluations focus on ESSIM as an integrated multi-stakeholder initiative and the way in which stakeholders carry out their responsibilities towards integrated management.

4.2 Contextual Evaluation of ESSIM

Contextual evaluation is normally undertaken before a program is formally initiated, and ascertains that the selected objectives and goals are realistic and representative of what stakeholders require.

The quality of opinions that define program objectives and the best strategies by which these can be achieved, as well as the resources and priorities that should be allocated, are highly dependent on all stakeholders having sound knowledge and appreciation of a multiplicity of factors (i.e., political,


OPERATIONAL FRAMEWORK FOR INTEGRATED MANAGEMENT OF ESTUARINE, COASTAL AND MARINE ENVIRONMENTS IN CANADA
INPUT EVALUATIONS
OUTCOME EVALUATION

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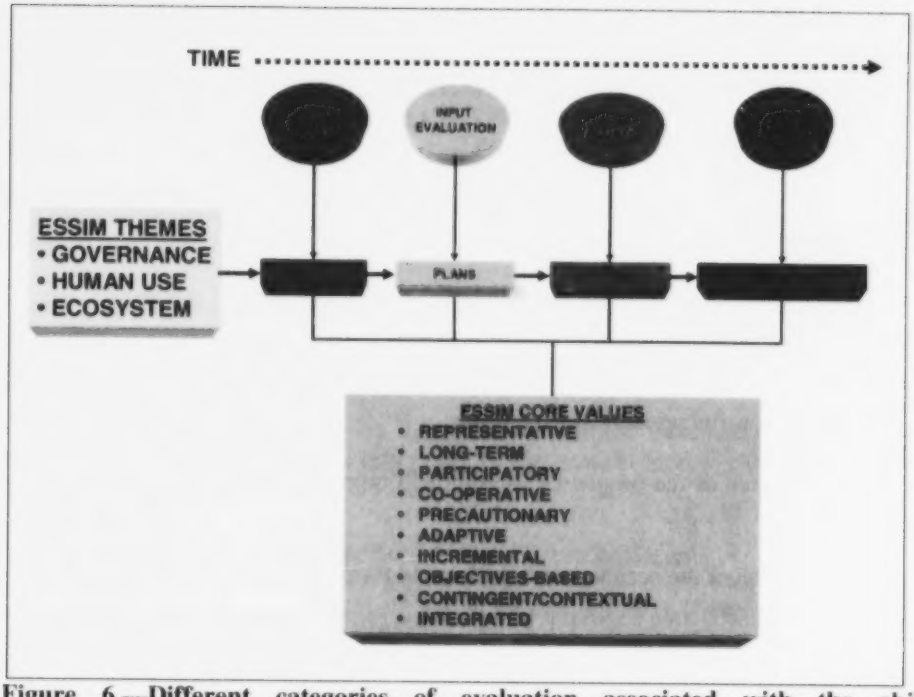
- Summative evaluations, which are normally conducted after an agreed period of time (several years), will require integrated assessments involving elements of all evaluation categories.

- Although Figure 3 depicts that there is also an anticipated logical sequence to the evaluation categories, it is likely that aspects of all of the categories will persist throughout the initiative. Therefore, each evaluation category will require its own program of activity, depending on how ESSIM is progressing.

- An evaluation system for ESSIM should also relate to the individual objectives of the plan, actions, products and outcomes (i.e., for governance, human uses (social/economic) and ecological). The different evaluation categories can be related to these as shown in Figure 6.



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economic, social, ecological, and technical). A prerequisite to evaluation is the availability and use of relevant information that defines and assesses the ESSIM area, including relevant land-based social, economic and governance activities that are linked to ESSIM. Such information is used by stakeholders to prioritise issues, define outcomes that the initiative should deliver, and establish benchmarks and performance targets for actions.

There are numerous indicators and attributes that are associated with contextual evaluation of initiatives such as ESSIM. These include, among others, the following:

- The status of available knowledge and information (quality and relevance);
- Identification of stakeholders and their concerns;
- Identification and prioritization of issues;
- The relevance of the program's mission and objectives in relation to the issues that require attention;
- Identification of the ocean area(s) that should form part of the program;
- Identification of factors that might affect or influence the achievement of program objectives;
- Identification of new concepts and their potential for application;
- Identification of gaps and inadequacies that require attention;
- The principles and values for the initiative;
- The level of awareness and understanding amongst potential program participants, and the extent of interest (commitment) shown by stakeholders; and
- A multitude of contributions (ideas, concepts, and options) as to what needs to be done, and how these could be carried out.

Activities and products that have provided contextual information and background for the development of ESSIM include the following:

- Development of federal policy, regulations, plans and operational procedures for ocean management that are relevant to ESSIM (DFO 2002b; DFO 2005);
- Reviews of policy and integrated management practices (Walmsley *et al.*2005);
- Development of conceptual ecological approaches to ocean management (O'Boyle *et al.* 2004; Rice and Lear 2005);
- Scientific reviews of the ecosystem and its components (Breeze *et al.* 2002; Zwanenberg *et al.* 2002; Frank 2003; Arbour and Kostylev 2002; Breeze 2004);
- Reviews of the impacts of certain pollution sources (e.g., Stewart and White 2001);

- Overview of regulatory stakeholders and frameworks (Chao *et al.* 2004);
- Economic review of the ocean sector in Nova Scotia (Gardner Pinfold 2005);
- Review of the issues facing ESSIM (Coffen-Smout *et al.* 2001);
- Regular general meetings of ESSIM stakeholders to solicit opinion (Rutherford *et al.* 2004; Coffen-Smout *et al.* 2005);
- Ongoing monitoring programs of fish stocks, fish landings and environmental conditions, including a Regional Advisory Process (RAP) that provides peer reviewed information and advice on the status of fisheries and marine mammal resources (DFO 2006);
- The establishment of a website for disseminating reports, information and for stimulating interaction between stakeholders (e.g., http://www.mar.dfo-mpo.gc.ca/oceans/e/essim/essim-background-e.html);
- An atlas of human activities on the Scotian Shelf (DFO 2005); and
- Ongoing and iterative formulation of a stakeholder-approved plan (DFO 2005).

Since 2001, ESSIM has been involved in an ongoing process of developing and evaluating its proposed objectives. This has included several contextual evaluations of the objectives, which have become progressively more acceptable to stakeholders. The contextual evaluations, facilitated by the ESSIM Planning Office, have been carried out through a process of inclusive interaction with stakeholders (by interactive workshops, public meetings, and interactive websites) that have solicited comment and opinion on progressive versions of the objectives (Coffen-Smout *et al.* 2005). A comparison of the original ESSIM 2001 objectives (DFO 2001) and the current 2006 objectives (see Annex 2) reveals that there has been little change to the overall intent, but that stakeholders have required more detail and expansion.

The ultimate formal approval of the ESSIM Plan objectives by the respective ESSIM coordinating bodies (Stakeholder Advisory Council and RCOM) is still awaited, but represents the endpoint of a first phase formal contextual evaluation of the objectives for the ESSIM Plan.

The approach to contextual evaluation has been acceptable to stakeholders, as evidenced by the participation and comments received from stakeholders. There is thus no need to change or revise the general approach and method. Following approval of the Plan's objectives, there will be a need to revisit the 2006 objectives after an agreed period of implementation (e.g., 2–5 years) in order to ascertain whether the objectives should be changed or modified. The details of the evaluation and the procedure by which it is carried out should form an agenda item of the Stakeholder Advisory Council.

4.3 Input Evaluation of the ESSIM Plan

Input evaluation is concerned with assessing the strategies, work plans, resources and budgets that are envisaged as being most appropriate to achieve the agreed objectives.

Input evaluations require that the following prerequisites are available in adequate detail:

- A description of the strategies by which each of the agreed objectives is to be achieved;
- A description of the action plans (activities and timetables) associated with each of the strategies;
- A description of the resources required in relation to their availability, procurement and mobilization (funding, personnel, equipment, and operating expenses);
- A description of deliverables (products associated with the action plans). This should include outputs, intermediate outcomes, and end outcomes; and
- A description of the institutions, organizations and persons responsible and accountable for ensuring that outcomes and objectives are achieved.

The 2005 ESSIM version of the draft plan (ESSIM Planning Office 2005) contains a description of some of the above prerequisites and this was presented to stakeholders for a preliminary evaluation in February 2005. The outcome of the evaluation was a request by stakeholders for revision and refinement (Coffen-Smout *et al.* 2005).

It is suggested that input evaluation for ESSIM could take the following form:

- It is unrealistic to assume that a comprehensive strategy and associated implementation plan (in detail) can be produced simultaneously for all of the ESSIM Plan's 28 objectives. Therefore it is proposed that this should be done following a phased (incremental) approach with an initial focus being given to general strategies, and then on to an initial phase aimed at evaluating inputs to a manageable number of priority objectives. Because ESSIM is in essence a coordinating mechanism aimed at promoting integrated management, initial focus could be aimed at evaluating inputs to some of the governance objectives. Achievement of ESSIM objectives for human use and the ecosystem are more long-term and can be conducted as and when the detail of implementation is worked out.
- It is assumed that the task of preparing all ESSIM strategies and implementation plans is the responsibility of the ESSIM Planning Office. The process by which these are evaluated could include the following steps:
    - A document is produced by the ESSIM Planning Office for each of the ESSIM sub-objectives so as to conform to certain minimum requirements of detail (more or less on the lines of the LFA approach). Information could include: responsible parties, budget allocation, resources to be deployed, any critical assumptions, outputs and deliverables, anticipated outcomes, indicators for assessment, and proof of verification.
    - The document is given to a selected group of stakeholders for evaluation and comment. Criteria for evaluation could include:
        - Quality of the implementation plan in terms of information supplied;
        - Feasibility in terms of time-scale and resources (funding and personnel) allocated;
        - Value of the expected products and outcomes; and
        - Completeness of the implementation plan in terms of coverage.

- The evaluations and comments are placed on the agenda for discussion at SAC meetings for discussion and decision.

It is possible that there might be many independent ideas and proposals that are concerned with carrying out activities relevant to ESSIM and seeking some form of support from ESSIM (e.g., research proposals, funding requests and event proposals). Provision for evaluation of these should also be made using a similar approach to that described above.

4.4 Process Evaluation of ESSIM

Process evaluation monitors, documents and assesses the progress that is made on all program activities, and specifically the delivery of outputs and products that were agreed upon at the outset. It allows for an assessment of efficiency and performance, particularly where there are time scales linked to achievement of objectives and the delivery of certain outputs. The prerequisite for process evaluation is the presence of an implementation plan with associated time-scales for the completion of activities and the delivery of specified products.

There have not yet been any formal process evaluations of ESSIM activities in terms of deliverables and timeframes mainly because there has not yet been any agreed program of implementation on which evaluation can be applied. However, assuming that there are agreed and approved programs for ESSIM objectives, it is suggested that process evaluation take the following approach:

- A biennial ESSIM progress report is produced by the ESSIM Planning Office that describes quantitatively and qualitatively how far the initiative has progressed in terms of the delivery of products and the completion of agreed activities.

- The progress report should be circulated to all stakeholders for assessment and comment prior to the convening of a fixed biennial ESSIM Forum meeting. Comments on how the stakeholders assess progress could also be solicited by providing a questionnaire that is processed by the ESSIM Planning Office.

- Findings and comments should be aired at the biennial stakeholder forum workshop. The purpose of the biennial ESSIM Forum meeting should be geared towards carrying out a general formative evaluation of ESSIM (assessing progress, products and outcomes (see Section 4.5), as well as inputs proposed for the future).

4.5 Product and Outcome Evaluation

Throughout the course of ESSIM there will be many products and outcomes that require evaluation in order to confirm that the quality of the product or the degree of achievement (of an outcome) is within the expected norm. Ideally these products and outcomes will have been previously identified in the operational ESSIM Plan. There may also be situations when ESSIM stakeholders request that their own products be evaluated within the context of ESSIM.

Typical products of ESSIM include:

- Research results and methods
- State of ESSIM reports
- Collaborative process agreements and MoUs
- Functional working and coordinating groups

- Conferences and workshops
- Websites
- Newsletters
- Plans
- Policy statements
- Guidelines on best practice
- Evaluation reports

Typical outcomes include:

- Changes in behaviour of stakeholders
- Improved changes in the environment (social, economic and ecological)
- Improved changes in the quality and quantity of resources
- Reduced level of user conflict
- Outcomes related to the achievement of all the objectives (see Annex 2)

Individual and focused product and outcome evaluation will require:

- Identification of the specific product or outcome that needs to be evaluated followed by a proposal for an evaluation to be done. Initial identification could be done by any stakeholder, or by the coordinating structures (ESSIM Planning Office, SAC, and RCOM).

- There will be a need, under certain circumstances, for specific and focused evaluations to be done by external specialists who are not part of the ESSIM network. Such evaluations should be identified and approved by RCOM and SAC as they will require careful consideration and planning, and more importantly, allocation of resources for their implementation.

- Agreement on the merits of the evaluation and on a process and procedure by which it should take place.

- Undertaking of the evaluation by designated parties (e.g., individual or panel)

- Reporting on the evaluation via the most appropriate coordinating structure.

- A statement on the outcomes of the evaluation could be made by the coordinating structure and released through appropriate communication mechanisms (e.g., newsletter, website).

In most cases, evaluations of ESSIM products and outcomes could be facilitated by the ESSIM Planning Office. Use should be made of the human resources within the ESSIM stakeholder network for evaluation of products and outcomes.

There will also be a need to consider product and outcome evaluations in relation to possible inclusion in the suggested process evaluation carried out by the biennial ESSIM Forum Workshop (see Section 4.4).

Evaluation should be undertaken of the way in which the main coordinating mechanisms have functioned and performed (e.g., RCOM, the ESSIM Planning Office, the Stakeholder Advisory Council, science working group, and other working groups, the ESSIM website). This should possibly be facilitated by an independent external party (evaluator) that has not actively been involved in ESSIM. Independent evaluation could also be carried out on a biennial basis, certainly in the initial stages of ESSIM. Evaluations should be presented directly to the main ESSIM coordinating entities

(SAC and RCOM) – the objective being to identify areas where there can be improvement to the way in which coordination is carried out. The findings, as well as decisions on approaches for improvement, should also form part of the agenda at the biennial ESSIM Forum.

5. RECOMMENDATIONS FOR IMPLEMENTATION

Based on the above concepts and rationale, the following recommendations are proposed:

1. Evaluation should become more prominent by becoming a core responsibility and function of the lead coordinating ESSIM governance structures (RCOM and SAC). All meetings of the coordinating structures should therefore have formal agenda items that are concerned with the process of evaluating various aspects of ESSIM. This includes contextual, input, process, product and outcome evaluations and also decisions on how to respond to the findings of evaluations.

2. A firm timetable for the rollout of the detailed strategies and action plans associated with each of the 28 ESSIM plan objectives should be developed and agreed upon by stakeholders.

3. The next stage of the ESSIM initiative, notably implementation of the plan (2007–2008), will require some form of prioritization of actions. An initial focus could be on the development of collaborative governance structures and processes that cover some priority issues, as these are the mechanisms by which capacity to achieve integrated management (and the achievement of anticipated social, economic and ecological outcomes) will be developed.

4. There is a need for a process of debate and discussion on what ESSIM stakeholders would like to see being evaluated and how this should be done. The objective would be for stakeholders to agree on the specifications for a workable evaluation system that covers all of the necessary aspects of the ESSIM Plan and its implementation. This document could be used to provide background and starter material for this process.

5. The ESSIM Planning Office should play the role of facilitating all formal evaluations and for communicating findings to relevant parties.

6. In order to avoid the problem of evaluation becoming a burdensome and complex process, use could be made of the wider ESSIM stakeholder network for assistance. This could be achieved by having evaluation done by individuals, working groups, and panels from the network, selected on the basis of skills, experience and perspective. This would also raise the level of understanding, "buy in" and participation in the improvement of integrated ocean management for the Eastern Scotian Shelf.

7. The biennial ESSIM Forum stakeholder workshop has potential to become the main focal point for initiating, processing and finalizing all evaluation of ESSIM. The Forum meeting could focus on providing an overall assessment of the products, outcomes and progress and, where expectations have not been met, how these can be reached or improved. It could also examine forthcoming plans and provide an assessment of feasibility in terms of strategy and resources to be deployed.

8. A biennial "state of ESSIM report" should be prepared that contains a description of progress and achievements (against objectives), as well as outlining forthcoming activities for the next period. This report could form the major piece of documentation that is presented and discussed at the biennial ESSIM Forum.

9. Indicators for assessing progress and performance of ESSIM will be best identified through the preparation of the biennial state of ESSIM report. Their use and value will be confirmed through the Forum evaluation process. The evaluation process will also identify new indicators

that stakeholders wish to see included for future monitoring. It should be recognized that the set of indicators will change with time as ESSIM develops.

10. There will be a need, under certain circumstances, for specific and focused evaluations to be done by external specialists who are not part of the ESSIM network. Such evaluations should be identified and approved by RCOM and SAC as they will require careful consideration and planning, and more importantly, allocation of resources for their implementation.

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ANNEX 1.—List of Recommended Attributes to Monitor Progress and Performance in Implementing ICOM (From IOC 2005)

GOVERNANCE ATTRIBUTES OF MANAGEMENT SYSTEM

G1: Existence and functioning of a representative coordinating mechanism

G2: The existence and adequacy of legislation for ICOM

G3:The mandatory assessment of the potential effects of sectoral policies, plans, programs and projects

G4: The existence and functioning of a mechanism for the resolution of conflicts

G5: The existence and adoption of a plan for ICOM that details goals and objectives to be achieved

G6: The level of implementation of the plan

G7: The routine monitoring and evaluation of ICOM initiatives

G8: The availability and allocation of administrative resources for ICOM

G9: The existence and application of scientific research and its input into ICOM

G10: Stakeholder participation

G11: NGO The existence of NGOs and community organizations and the level of their activities in support of ICOM

G12: The incorporation of ICOM into educational and training curricula

G13: The use of technology, including environmentally friendly technology, to enable and support ICOM

G14: The use of economic instruments in addition to regulatory instruments to support ICOM

G15: The integration of ICOM into the national strategy for sustainable development

ECOLOGICAL ATTRIBUTES OF MANAGEMENT AREA

E1: Diversity of the coastal and marine ecosystem system

E2: Distribution of species

E3: Abundance or quantity of living matter in a given area/volume

E4: Production and reproduction

E5: Trophic interactions

E6: Mortality of species and populations

E7: Species health

E8: Water quality

E9: Habitat quality

ECONOMIC ATTRIBUTES OF MANAGEMENT AREA

S1: Total economic value

S2: Total employment

S3: Sustainably managed exploitation and use

S4: Pollutants and introductants

S5: Habitat alteration

S6: Disease and illness

S7: Weather and disaster

S8: Population dynamics

ANNEX 2.—ESSIM Objectives and Examples of Evaluation Questions and Indicators

	OBJECTIVE	EXAMPLES OF RELEVANT EVALUATION QUESTIONS[1]	EXAMPLES OF RELEVANT INDICATORS[2]
Governance			
Integrated management	Collaborative structures and processes with adequate capacity, accessible to community members are established	1. Is there a coordinating mechanism in place? 2. Are all key stakeholders participating in ESSIM? 3. Do all stakeholders have the capacity to participate? 4. Is the coordinating mechanism functional, and to what extent? 5. Is the coordinating mechanism sustainable, and to what extent? 6. Does the coordinating mechanism involve all levels of governance? 7. Does the coordinating mechanism have a defined mandate and authority? 8. Are all elements of the coordinating mechanism accountable? 9. Is the coordinating mechanism influential in stimulating required policies and programs? 10. Do the elements of the coordinating mechanism cover all aspects of the plan?	1. Yes/No 2. Membership of coordinating structures and gap analysis 3. Attendance list of meetings 4. Items on agendas and minutes of meetings 5. Budget allocated to support coordinating mechanism 6. Yes/No 7. Presence of agreed terms of reference/MoUs for coordinating mechanism elements 8. Reports from coordinating mechanism entities that are submitted to the ESSIM Forum. 9. Identification of number of actions that are associated with decisions made by ESSIM coordinating structures. 10. Gap analysis of coordinating structure against issues/aspects requiring coordination.

[1] Each evaluation will require the development of its own set of questions. These represent only examples of some that might apply to this ESSIM objective.
[2] Each evaluation question will require the development of a set of indicators that are used to provide qualitative and quantitative answers to the question. These represent examples of an indicator that might apply to each of the corresponding evaluation questions. There will be many others that are also relevant, but it is beyond the scope of this report to include these.

	Appropriate legislation, policies, plans, and programs are in place	1. Has a review been done of existing legislation and its adequacy? 2. Has the legislative review been discussed and processed by the SAC and ESSIM forum? Have ecosystem objectives been included in all relevant stakeholder resource management plans?	1. Presence of a review? 2. Items in minutes of RCOM, SAC and ESSIM Forum. 3. Presence of agreed ecosystem objectives in stakeholder resource management plans.
	Legal obligations and commitments fulfilled	1. Have legal obligations of ESSIM stakeholders been identified?	1. Presence of a document containing a description of legal obligations relevant to ESSIM.
	Ocean users and regulators are compliant and accountable	1. Have user and regulator compliance aspects been identified? 2. Are users and regulators demonstrating compliance?	1. Presence of a report on ESSIM compliance and accountability measures. 2. Statistics on compliance of users and regulators
	Ocean stewardship and best practices are implemented	1. Are there relevant guidelines and best practices that apply to ESSIM and have these been promoted and agreed upon by stakeholders?	1. Presence of guidelines that have been circulated to stakeholders.
	Multi-sectoral resource use conflict is reduced	1. What resource use conflicts have been officially reported to ESSIM for action? 2. What conflicts have been resolved through ESSIM coordination and facilitation?	1. Reported conflicts requesting official action by the ESSIM coordinating mechanism. 2. Items on the agenda and in minutes of SAC and RCOM meetings.
Information and knowledge	Natural and social science research is responsive to knowledge needs	1. Is there an ESSIM interdisciplinary research co-ordinating group? 2. Is there a research strategy that caters for the needs of ESSIM? 3. Are there resources for the implementation of the research program?	1. Presence of an ESSIM interdisciplinary research co-ordinating group. 2. Presence of a published ESSIM research strategy. 3. Presence of an ESSIM research budget and management system for implementation.
	Information management and communication are effective	1. Is information on the ESSIM initiative easily accessible to stakeholders? 2. Is information being used by the ESSIM stakeholders?	1. Information items on the ESSIM website. 2. Number of website hits and downloads of specific items e.g., reports.

	Monitoring and reporting are effective and timely	1. Is a monitoring and reporting framework developed? 2. Are monitoring and reporting mechanisms supported with sufficient resources? 3. Is monitoring and evaluation effective?	1. Presence of a monitoring and reporting framework. 2. Reports published e.g., biennial State of ESSIM. 3. Number of program changes made as a result of monitoring and reporting.
Sustainable Human Use			
Social and cultural well-being	Communities are Sustainable	1. Which are the communities that are considered to be unsustainable? 2. What actions have been put into place to develop community sustainability?	1. List of unsustainable communities 2. Resources that have been deployed through ESSIM to develop community sustainability?
	Ocean area is safe, healthy and secure	1. What are the main risks associated with the ESSIM area? 2. Are measures in place to address high-risk issues?	1. Search and rescue incidents; Economic losses from safety, health and security-related incidents. 2. Presence of guidelines and advisories on cited high-risk issues.
Economic well-being	Wealth is generated sustainably from ocean resources	1. Has ocean wealth in the ESSIM area been defined and assessed? 2. What are the pathways for the distribution of ocean wealth?	1. Estimates of ocean wealth for the ESSIM area. 2. Estimates of sector and community wealth derived from ocean resources.
	Wealth generated sustainably from ocean infrastructure	1. What is the infrastructure that contributes to wealth in the ESSIM area? 2. Is ocean infrastructure sustainable?	1. Assessments of ocean infrastructure in the ESSIM area. 2. Assessments of the sustainability of ocean infrastructure.
	Wealth generated sustainably from ocean and ocean-related activities	1. Are there any ocean related activities that have been identified as being unsustainable?	2. Reports that identify ocean-related activities in the ESSIM area that are unsustainable.

Healthy Ecosystems – Biodiversity			
Communities/ assemblages	Diversity of benthic, demersal and pelagic community types is conserved.	1. Has diversity of community types in the ESSIM area been quantified? 2. Have measures been taken to conserve priority aspects of biodiversity?	1. Maps and descriptions of biodiversity in the ESSIM area. 2. Conservation plans for priority aspects of biodiversity.
Species / Populations	Incidental mortality of all species is reduced	1. What is the level of species incidental mortality? 2. Are there guidelines and best practices on how to reduce incidental mortality?	1. Estimates of species incidental mortality. 2. Guidelines on methods and practices for reducing incidental mortality.
	At risk species protected and/or recovered	1. What at-risk species are present in the ESSIM area?	1. Number of species-at-risk in the ESSIM area.
	Invasive species introductions are prevented and distribution is reduced	1. What are the species that are considered to be invasive to the ESSIM and has their level invasiveness been quantified?	1. Inventory and numbers of invasive species in the ESSIM area
	Genetic integrity (i.e., genetic fitness and diversity) is conserved	1. Have genetic integrity objectives for the ESSIM area been quantified?	1. Quantification of genetic integrity objectives.
Healthy Ecosystems – Productivity			
Primary and secondary productivity	Primary and secondary productivity are optimized	1. What is the current state of primary and secondary productivity in the ESSIM area? 2. What factors influence primary and secondary productivity?	1. Primary and secondary productivity estimates. 2. List of key factors and their quantitative influence on primary and secondary productivity.
Trophic structure	Trophic structure is optimized	1. What is the current trophic structure and what is the optimal structure for the ESSIM area?	1. Quantitive and qualitative description of optimal trophic structure.
Population productivity	Biomass and productivity of commercially harvested and other species are optimized	1. What are the optimal harvest levels for commercial species in the ESSIM area?	1. Quantitative descriptions of optimal harvest levels for commercial species in the ESSIM area.

Healthy Ecosystems – Marine Environmental Quality			
Physical	Physical characteristics of ocean bottom and water column support resident biota	1. Have the optimal physical characteristics that support biota been defined for the ESSIM area?	1. Specified water quality objectives for physical parameters.
	Harmful noise levels are reduced to protect resident and migratory species and populations	1. What are the current levels, and sources, of noise in the ESSIM area? 2. Have harmful noise levels been quantified?	1. Ambient noise levels in the ESSIM area. 2. Quantitative definition of harmful noise levels for species.
	Wastes and debris are reduced	1. What are the current quantities and sources of waste and debris in the ESSIM area?	1. Inventory of quantities of ocean waste and debris.
Chemical	Chemical characteristics of ocean bottom and water column support resident biota	1. Have the optimal chemical characteristics that support biota been defined for the ESSIM area?	1. Specified water quality objectives for chemical parameters in the ESSIM area.
	Atmospheric pollution from ocean activities is reduced	1. What is the current level of atmospheric pollution from ocean activities?	1. Inventory of atmospheric pollution emissions (sources and types).
Habitat	Habitat integrity is conserved	1. What habitats require conservation?	1. Inventory of habitats requiring conservation